RELIANCE OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal RU 512-17
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal RU 512-17
Field Rulison
County Garfield State Colorado
Location: API # : 05-045-23732
SEC 17 TWP 7S RGE 93W

Other Services
--

			Elevation
Permanent Datum	Ground Level	Elevation 8365.6'	K.B. 8389.6'
Log Measured From	Kelly Bushing	24 FT	D.F. 8388.6'
Drilling Measured From	Kelly Bushing		G.L. 8365.6'

Date	11-APR-2018
Run Number	One
Depth Driller	10804 FT
Depth Logger	10771 FT
Bottom Logged Interval	10755 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	255°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	16:50
Equipment Number	HD-0359
Location	Grand Junction, CO
Recorded By	Z. Fisher
Witnessed By	Dustin Welsh

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size (in)	Wgt (lbs/Ft)	Grade	Top	Bottom
Surface Casing	9 5/8	32.3	H-40	Surface	1121 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	10765 FT
Intermediate #2					
Liner					

<<< Fold Here >>>

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Log ran as per customer request
Depth referenced to Kelly Bushing at 24 FT
Marker Joint Logged from 6943-6965 FT
Log ran from 10755 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!

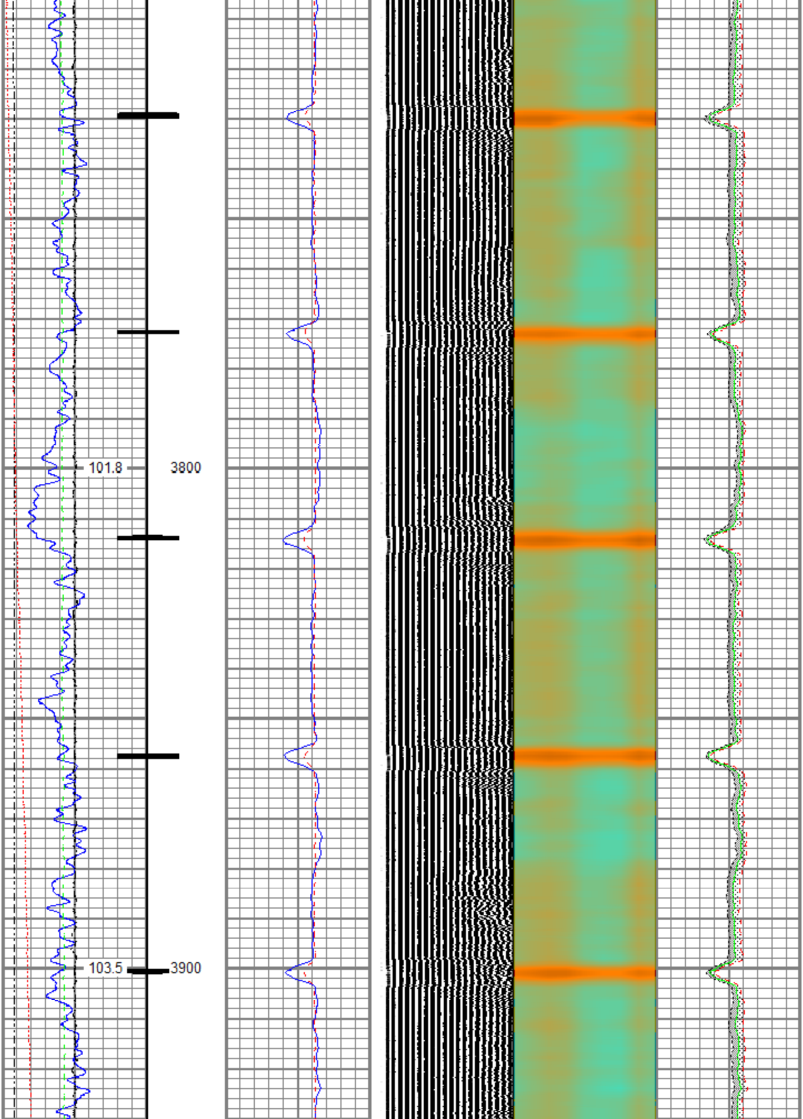
RELIANCE OILFIELD SERVICES

Main Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep\federal ru 512-17\tep_federal ru 512-17_rbl_04-11-18.db
Dataset Pathname	main.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Apr 13 15:18:55 2018
Charted by	Depth in Feet scaled 1:240

Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 (usec) 1200		0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				
Casing Collar Locator				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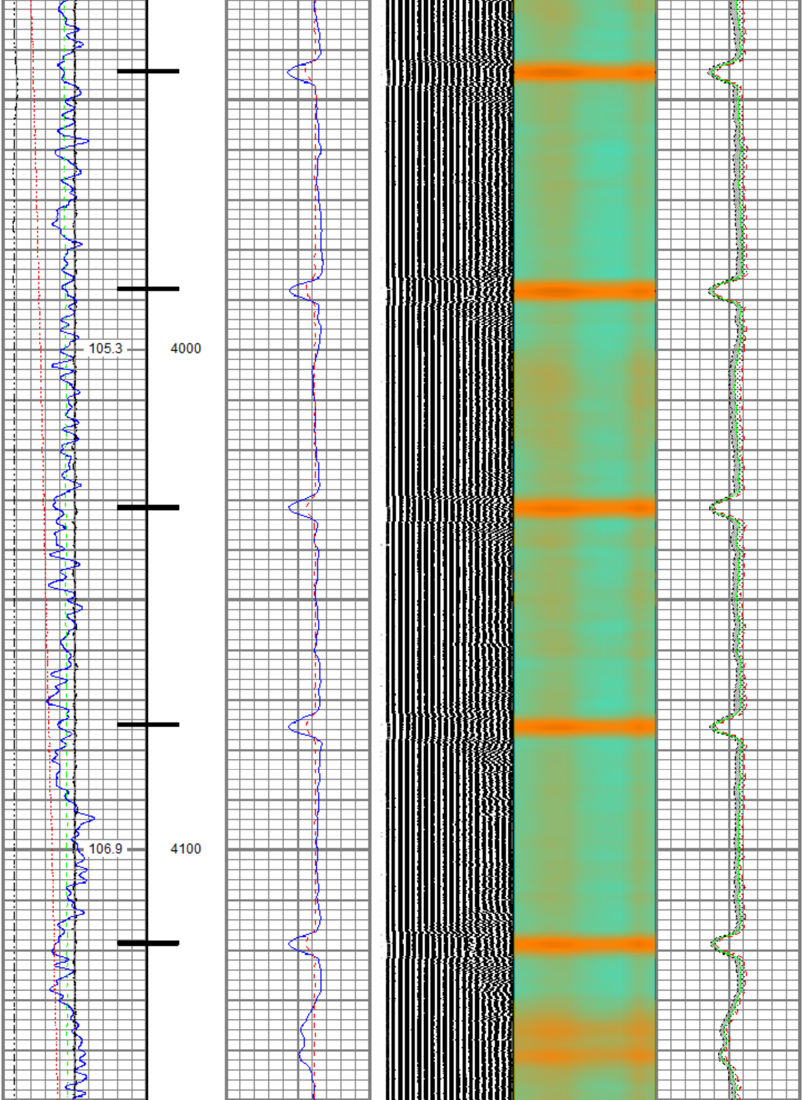
3800
103.5
3900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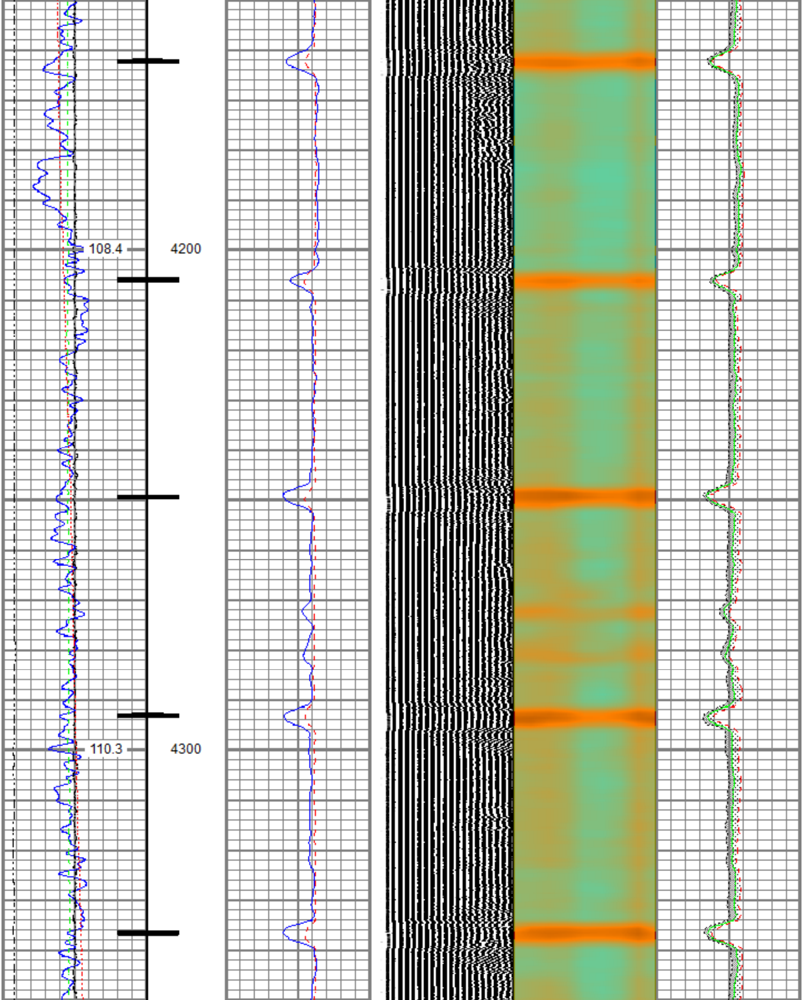
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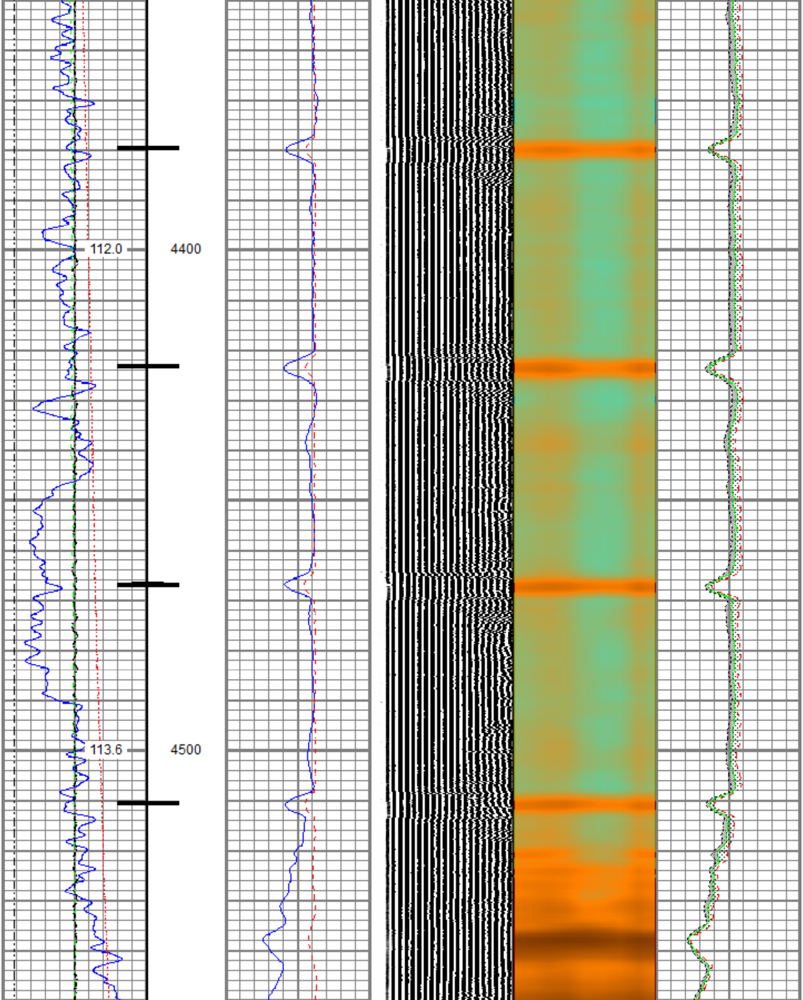
4200
110.3
4300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4400
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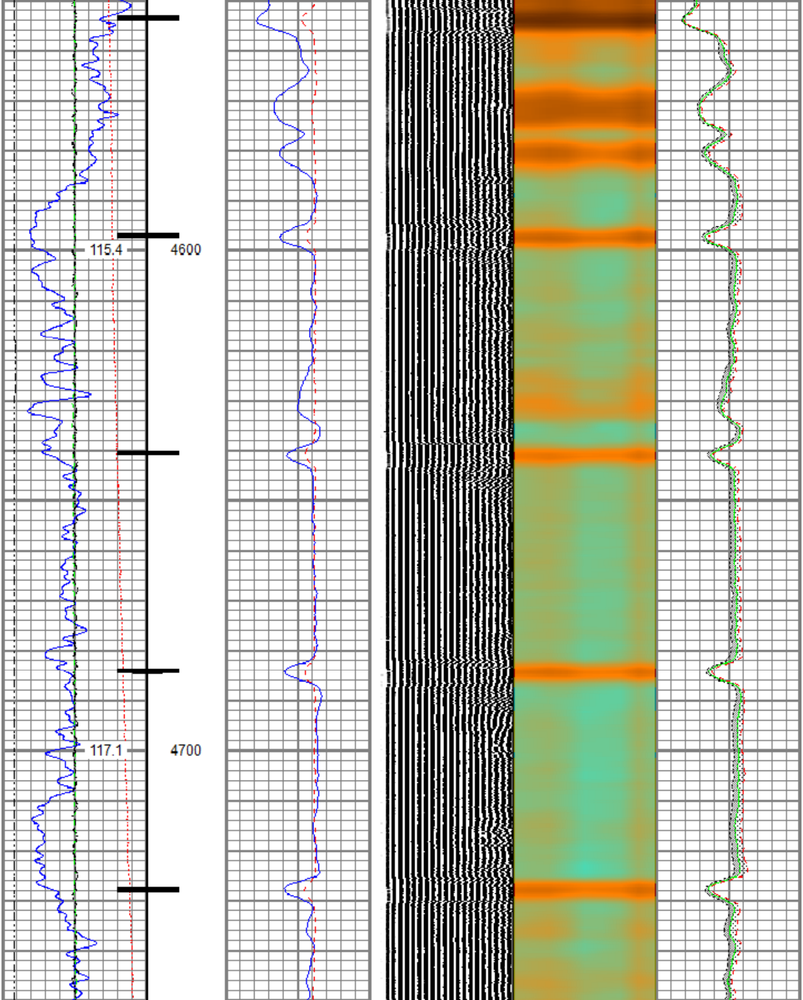
4500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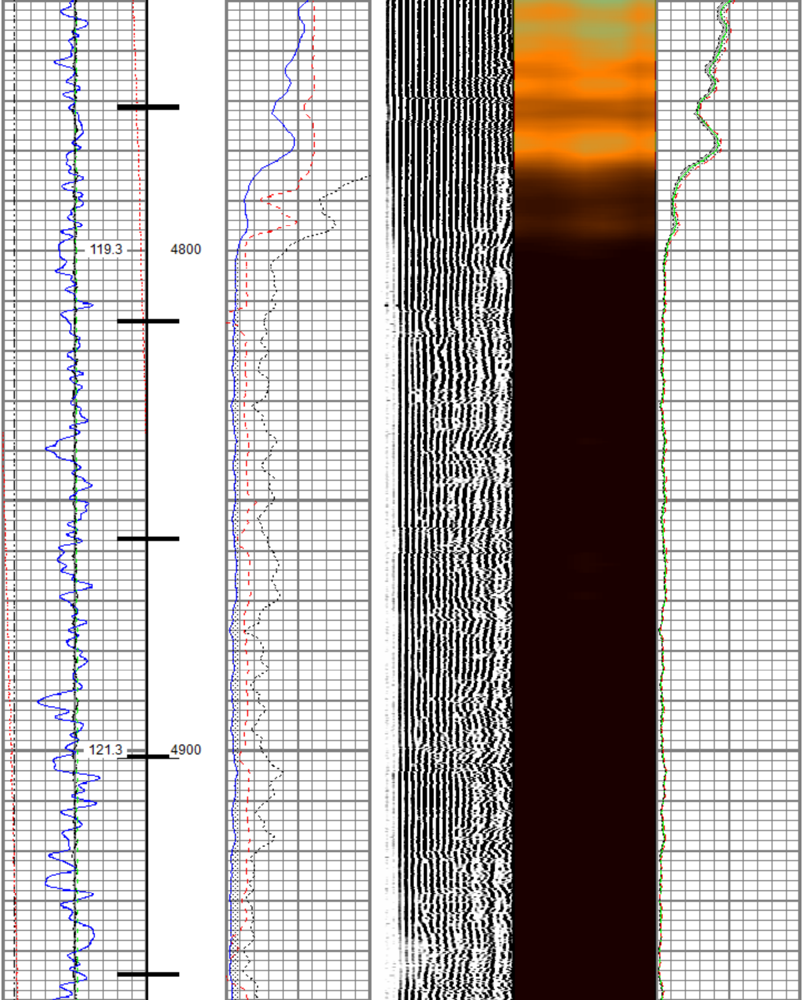
4700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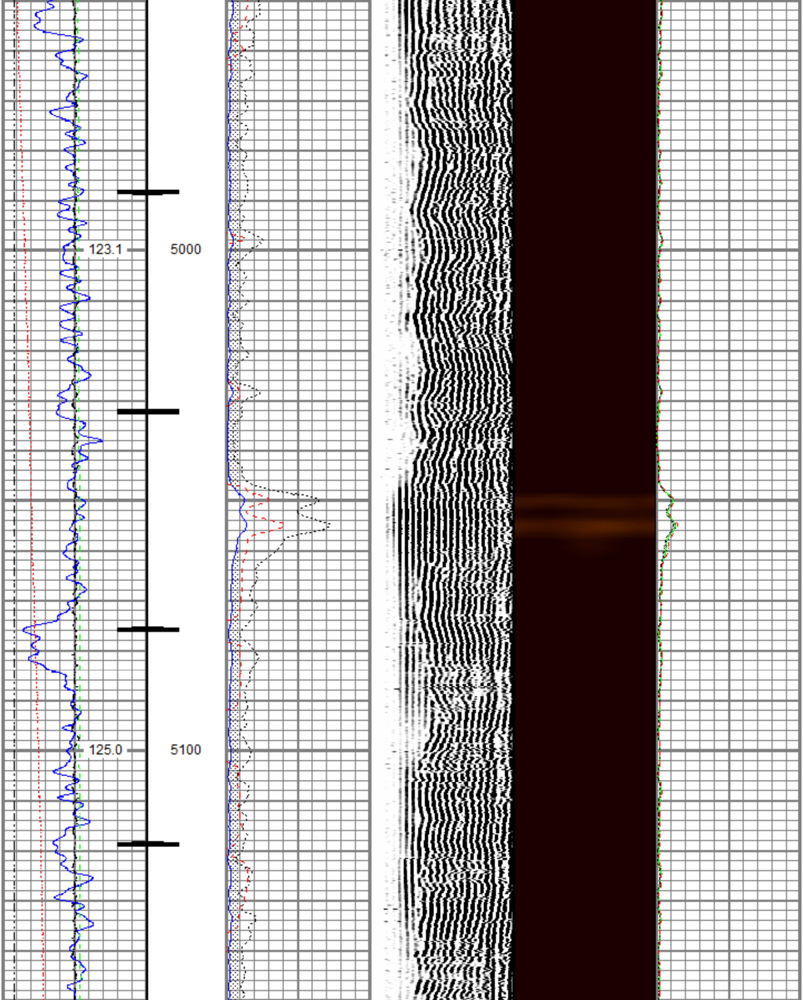
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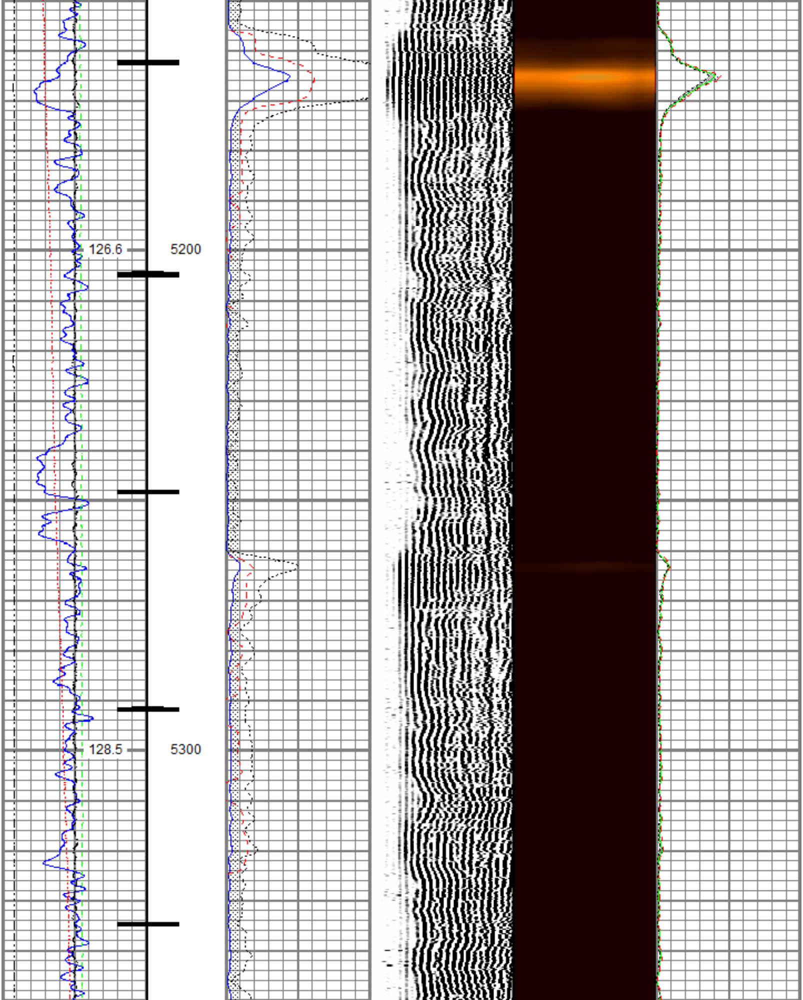
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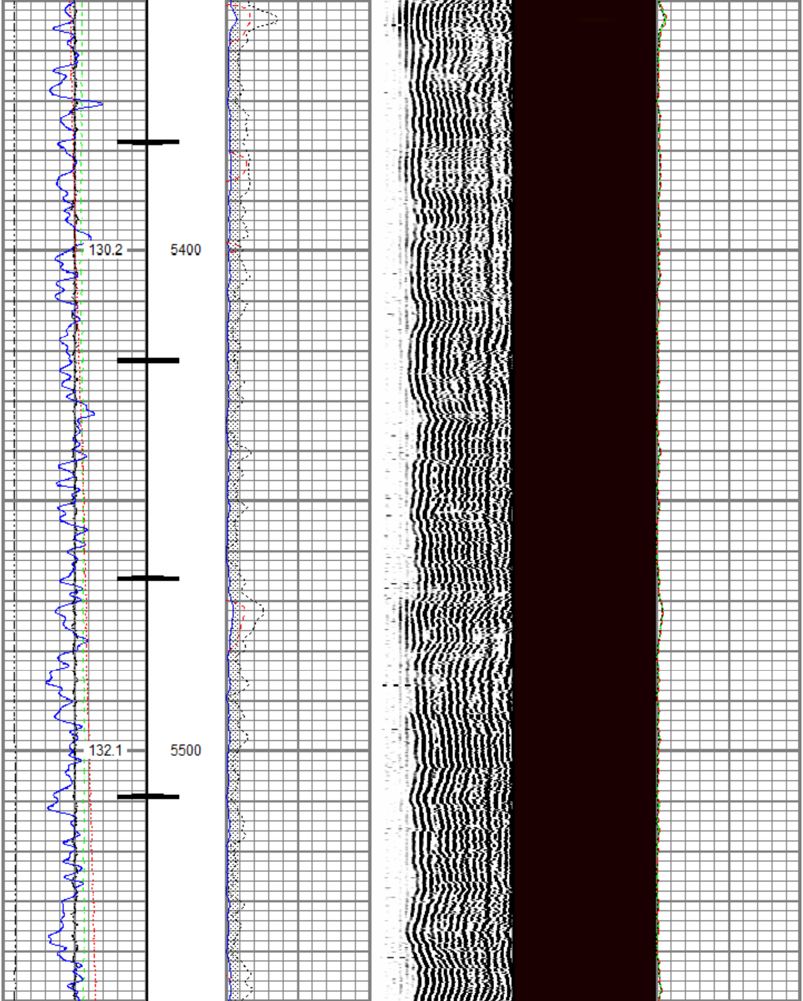
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132.1
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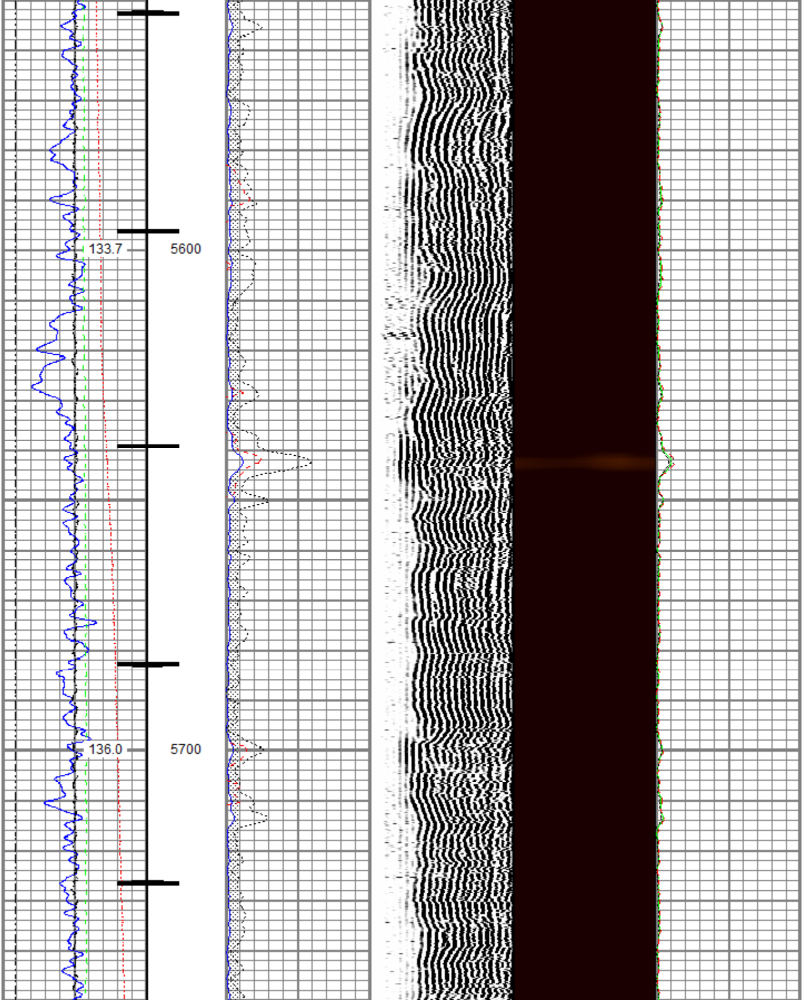
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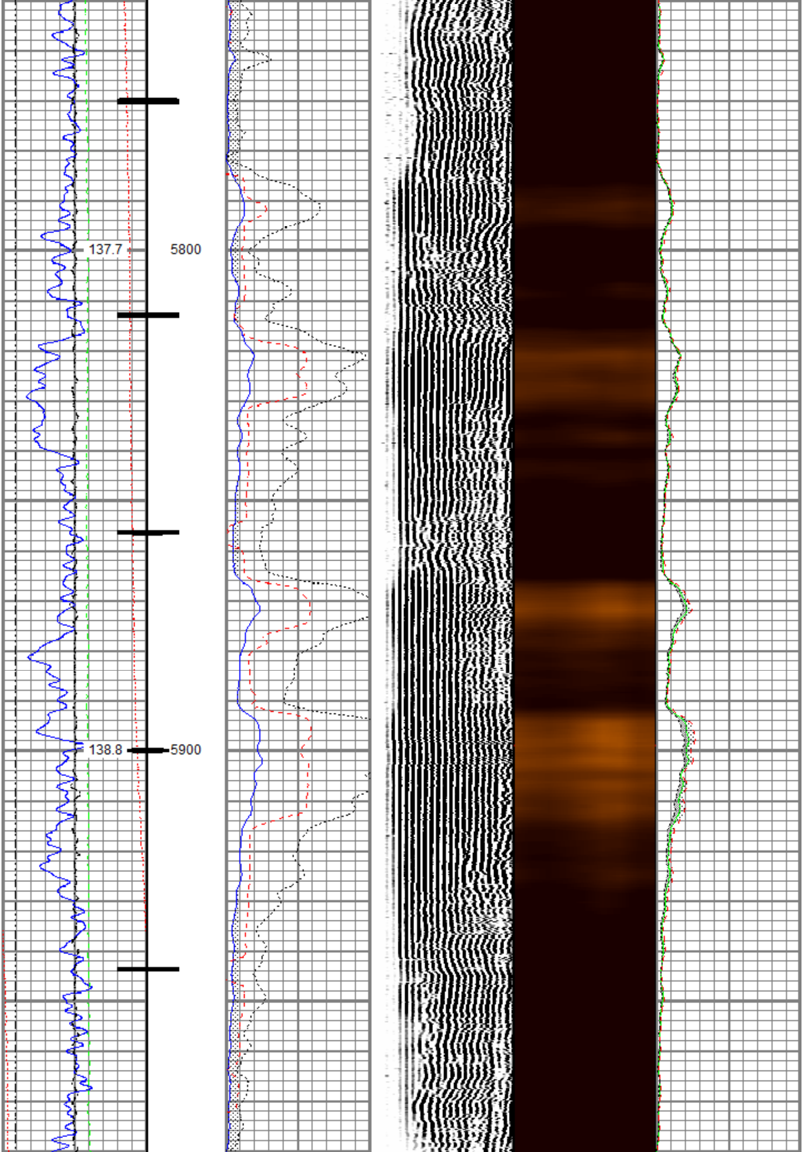
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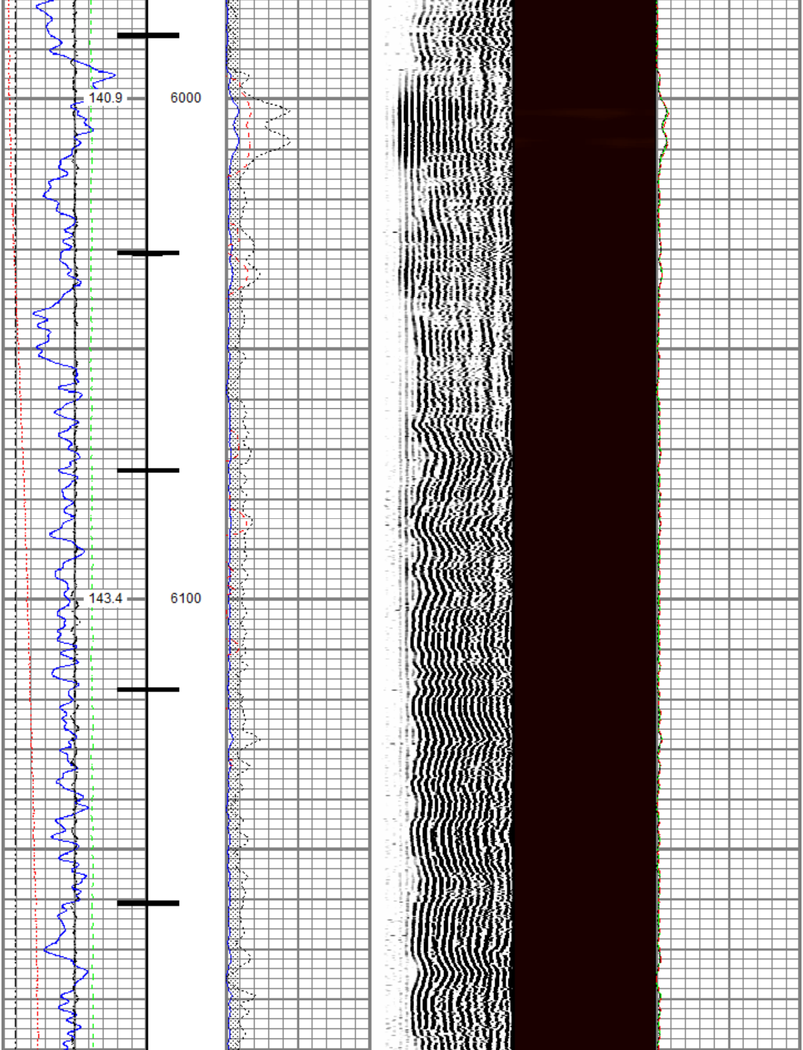
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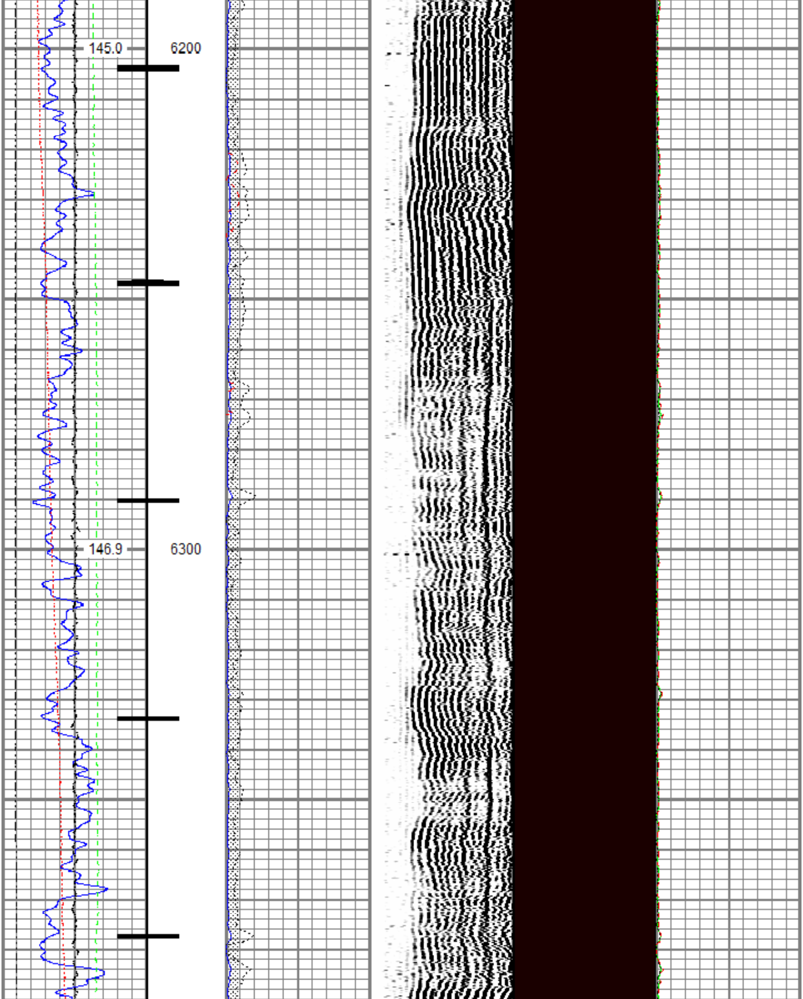
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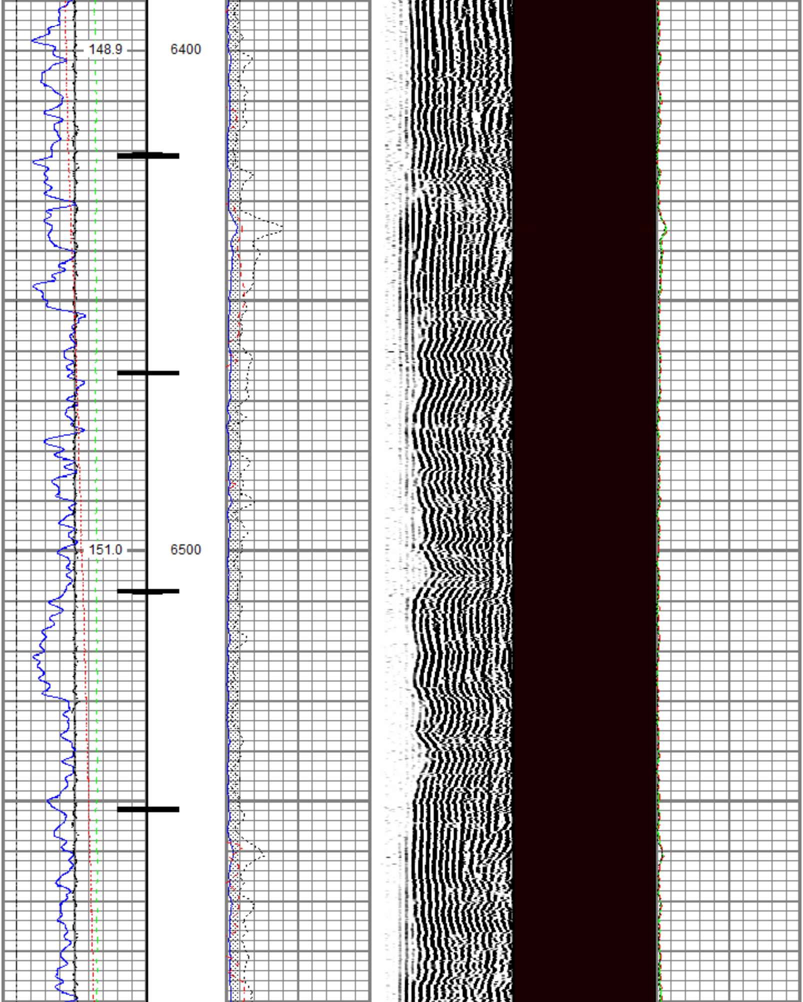
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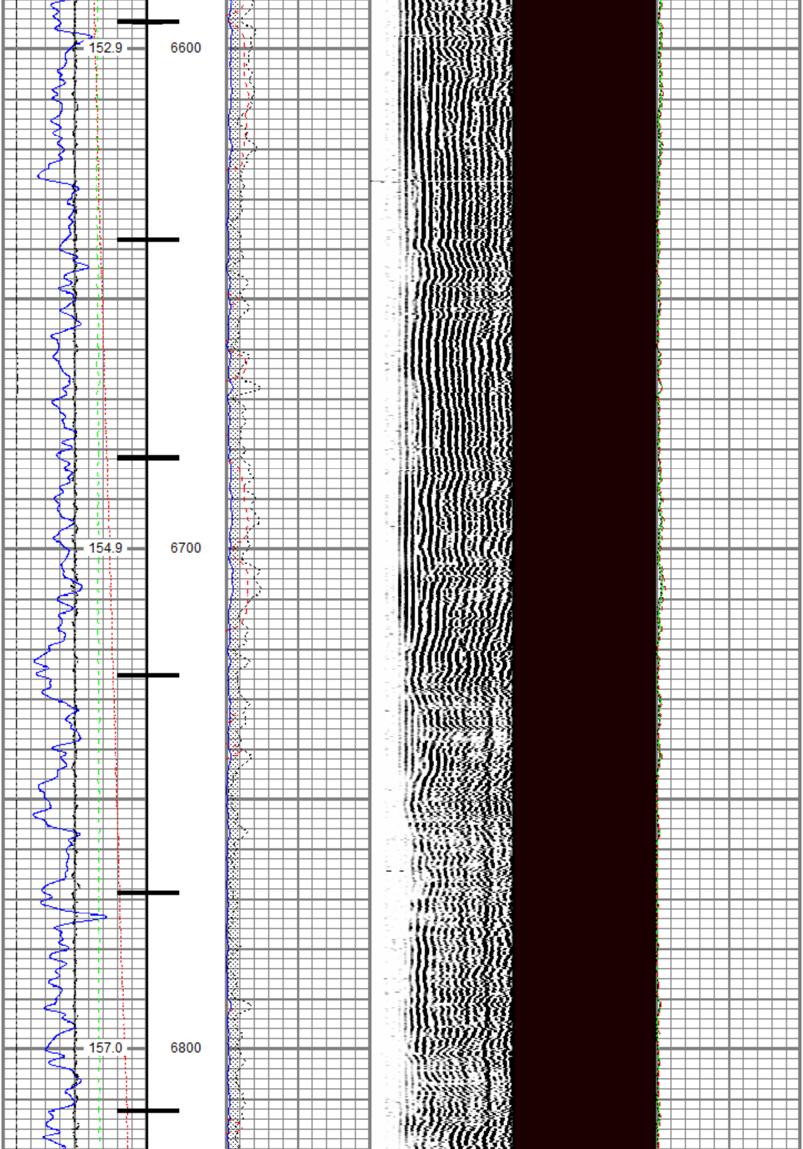
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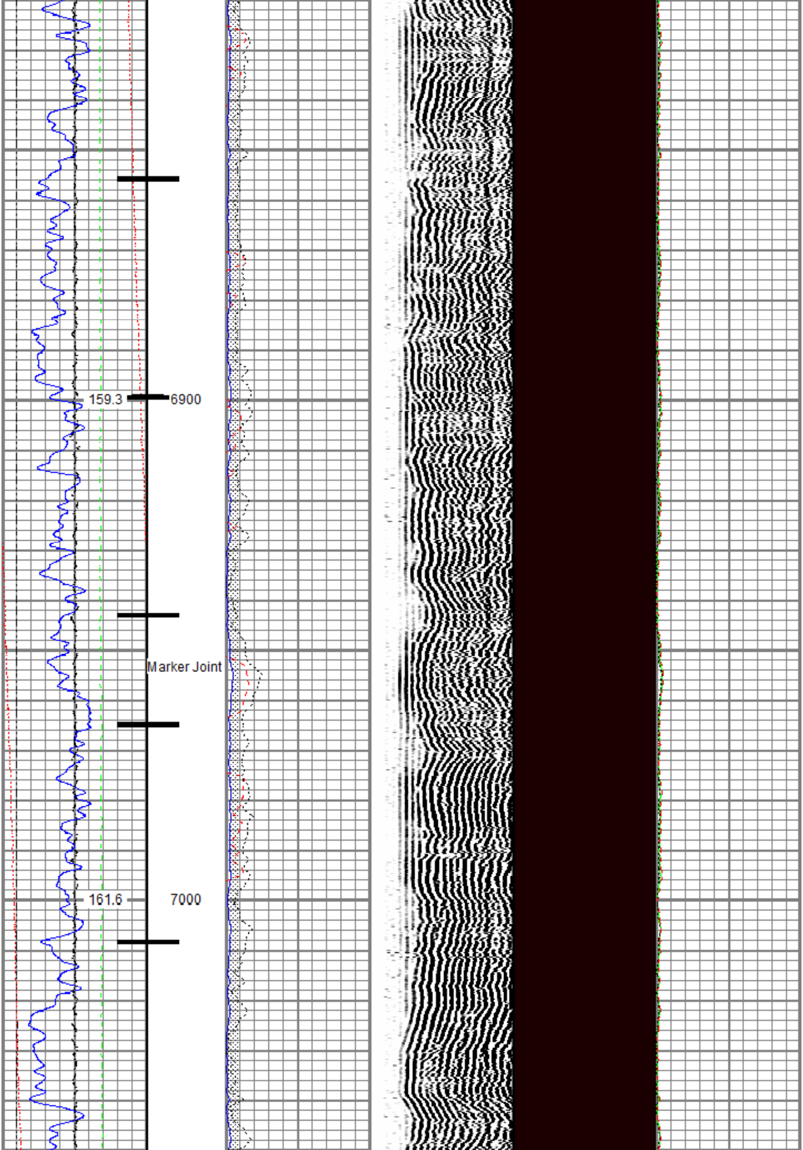
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Marker Joint
161.6
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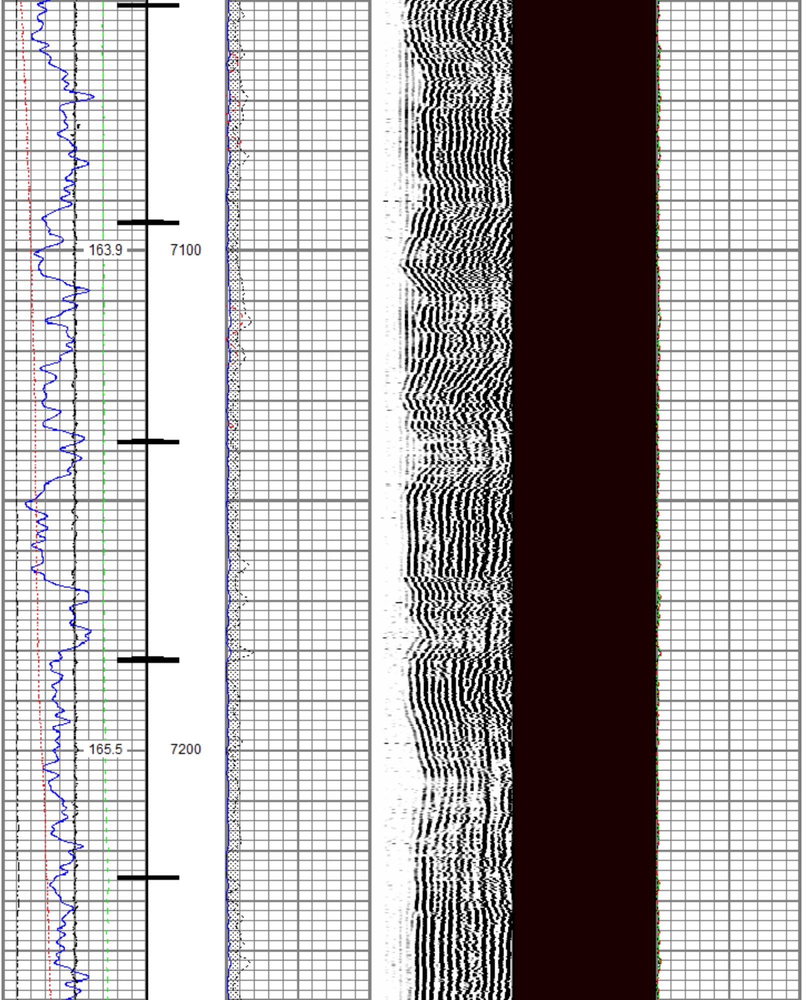
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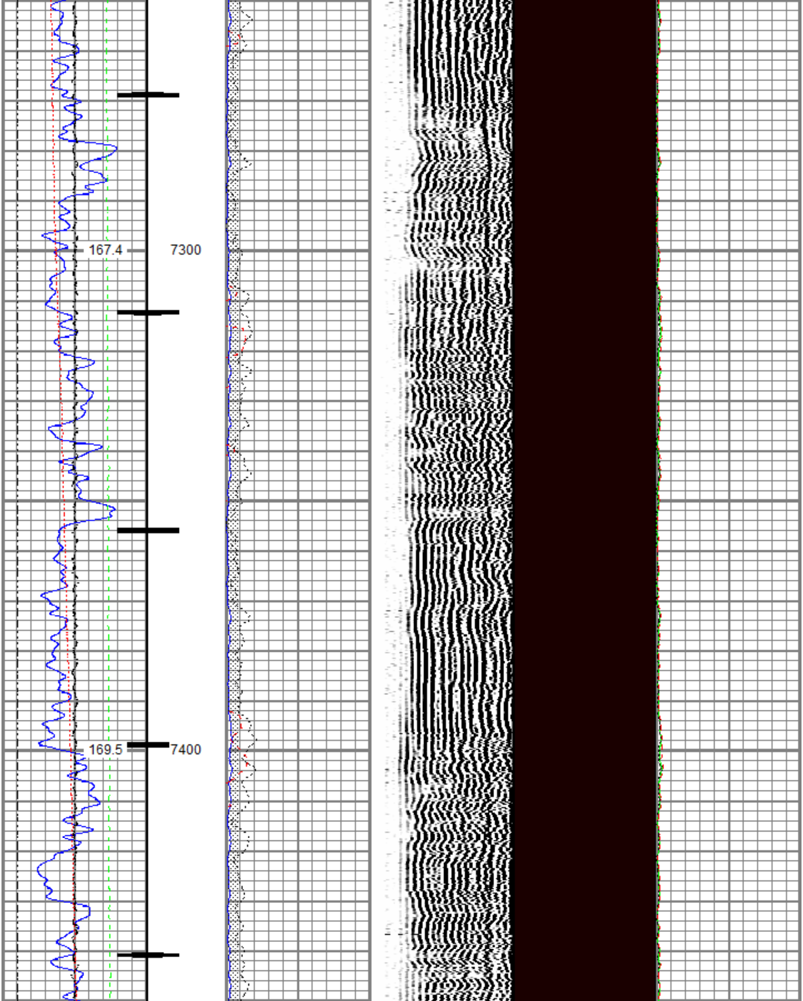
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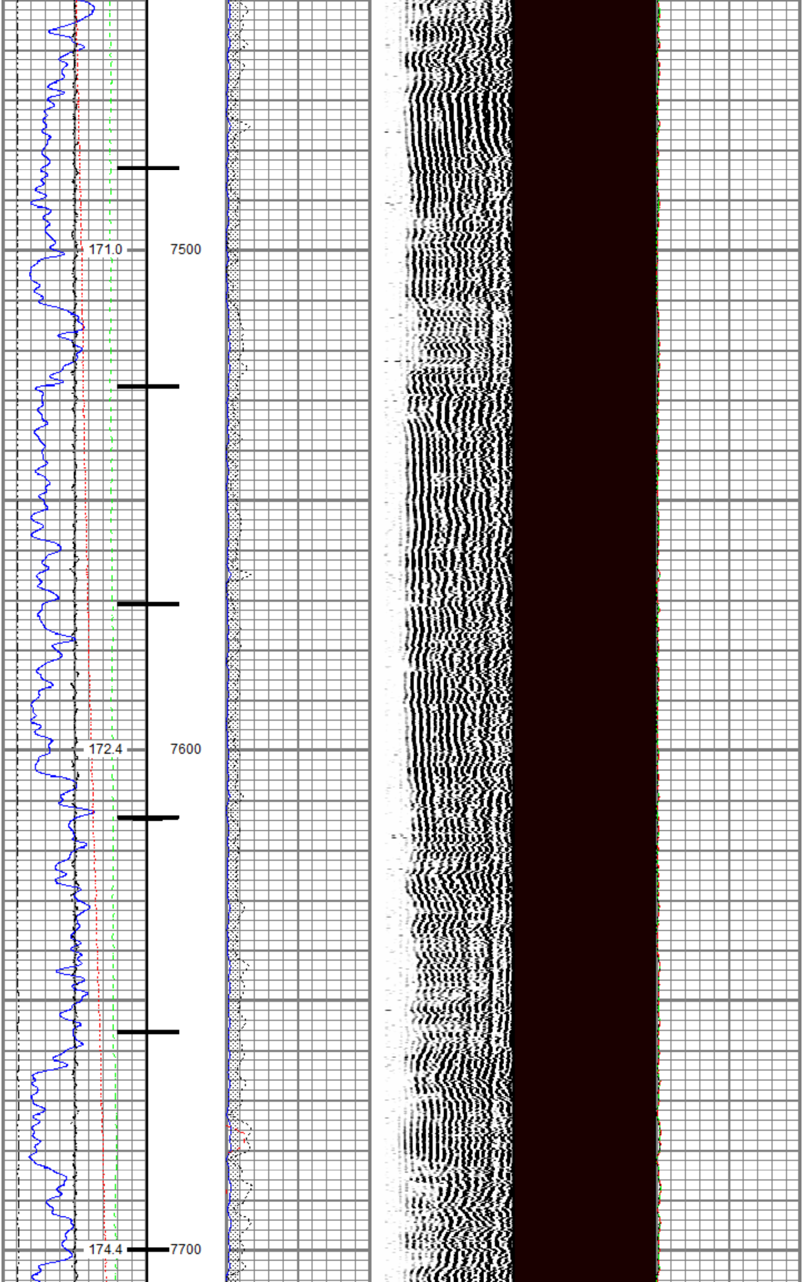
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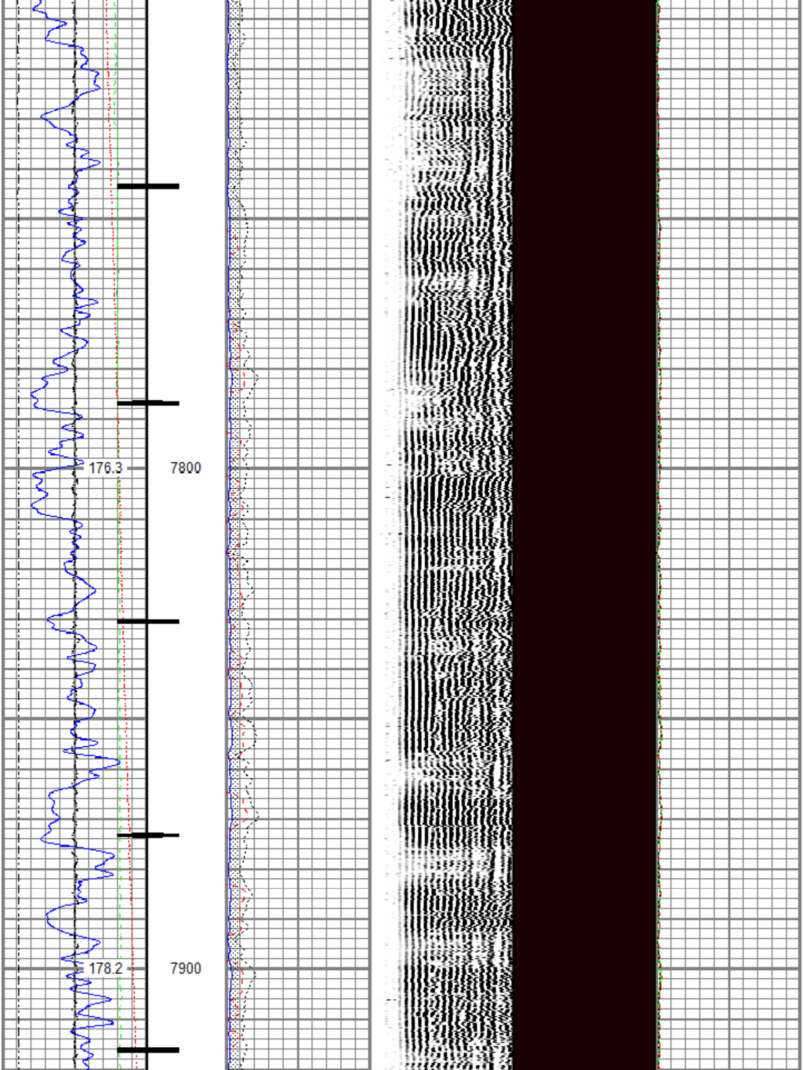
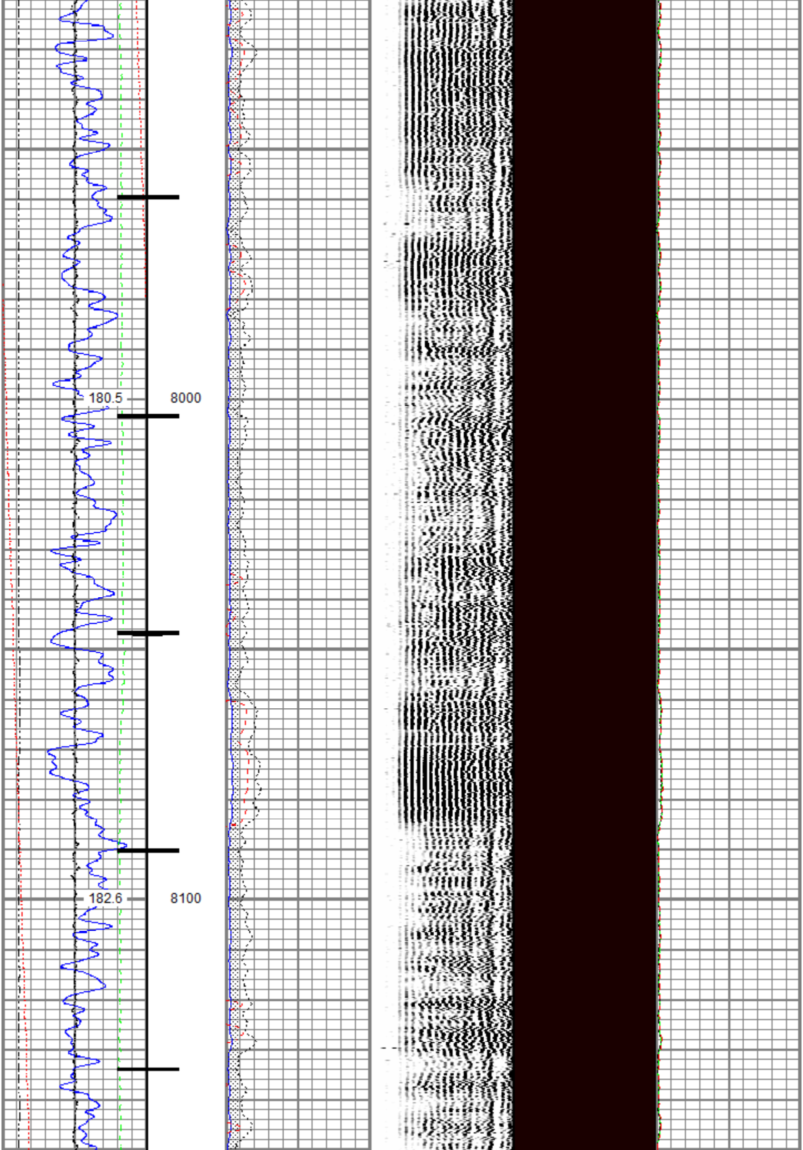
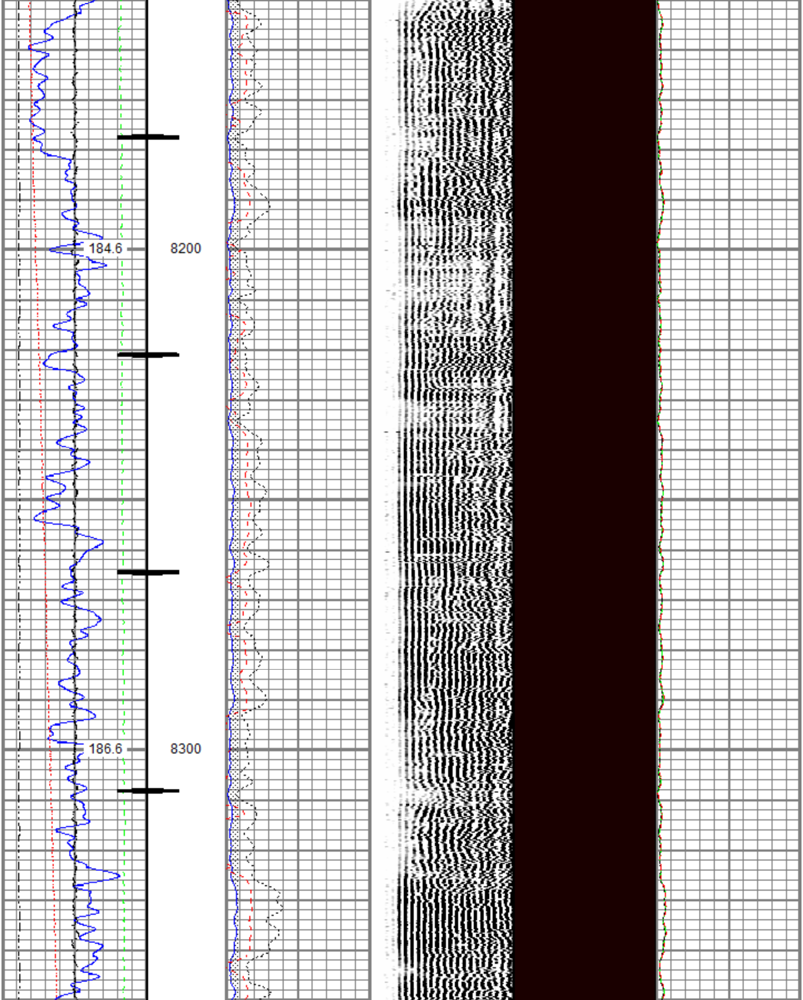
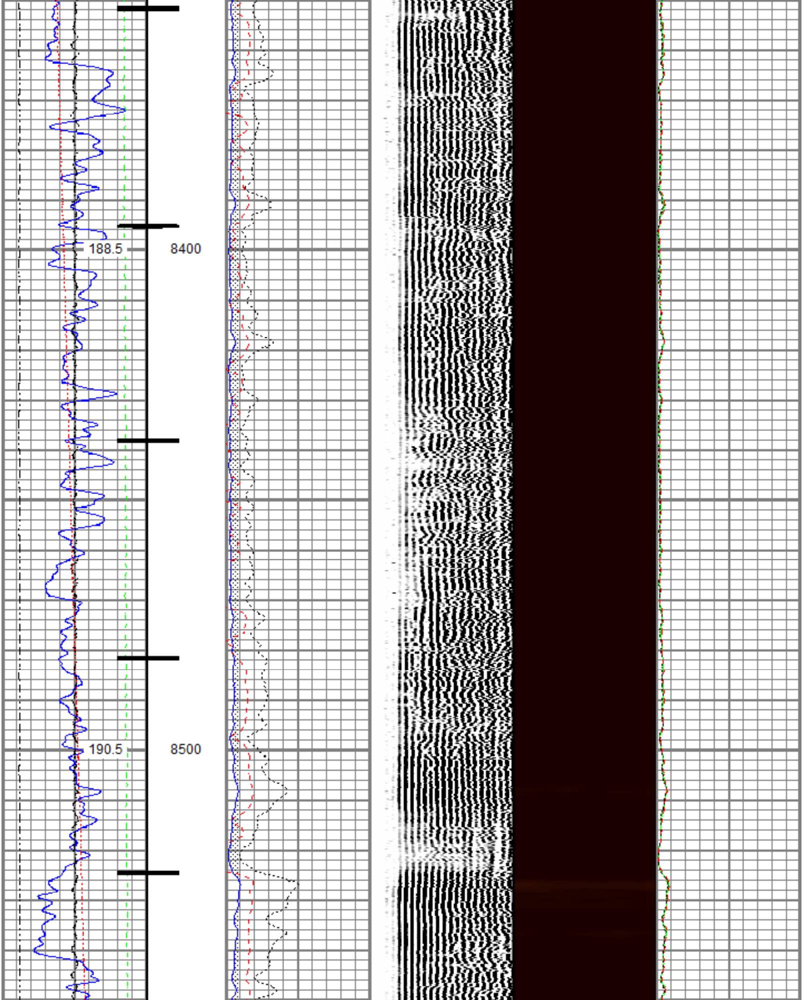
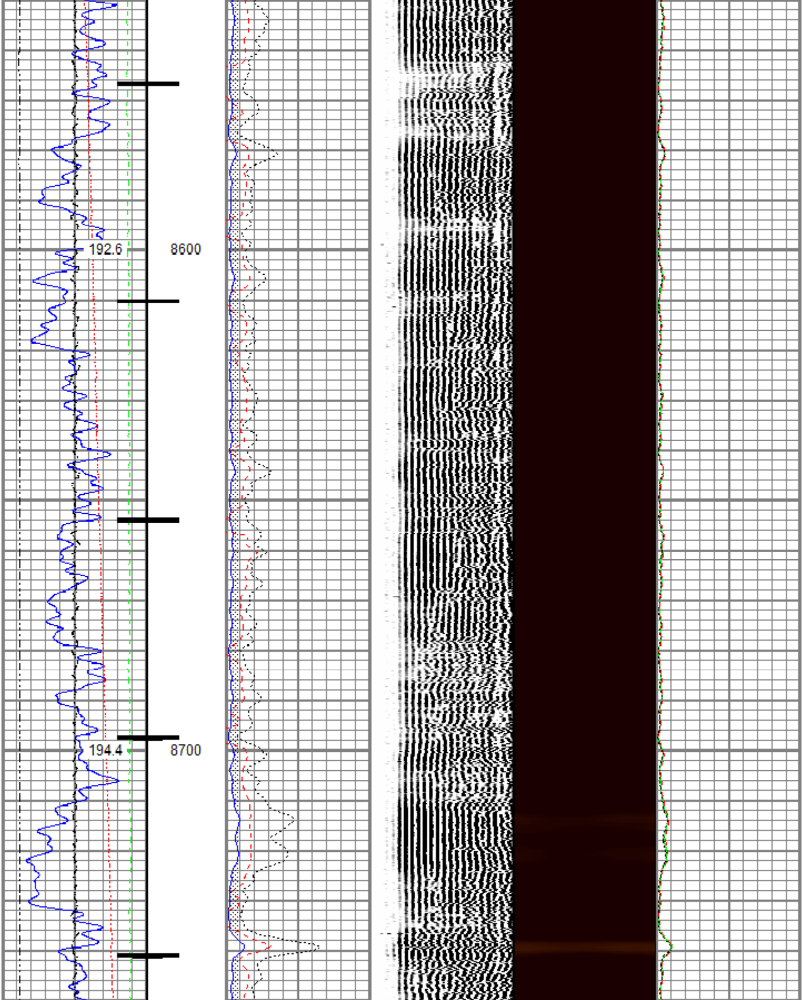
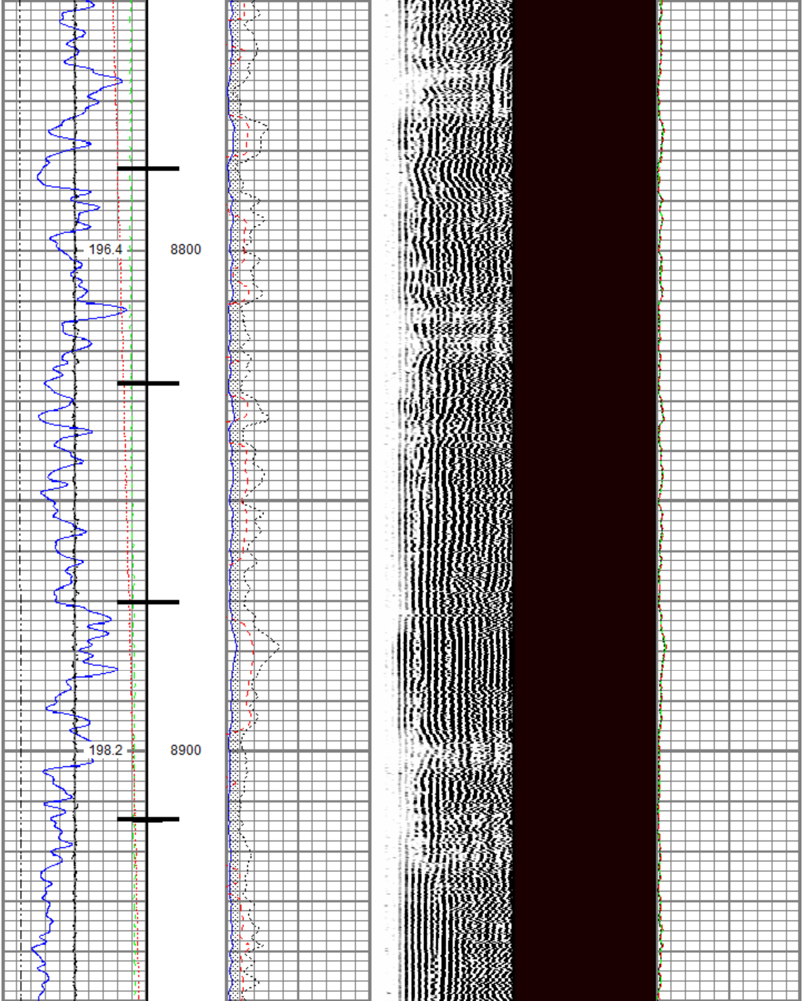


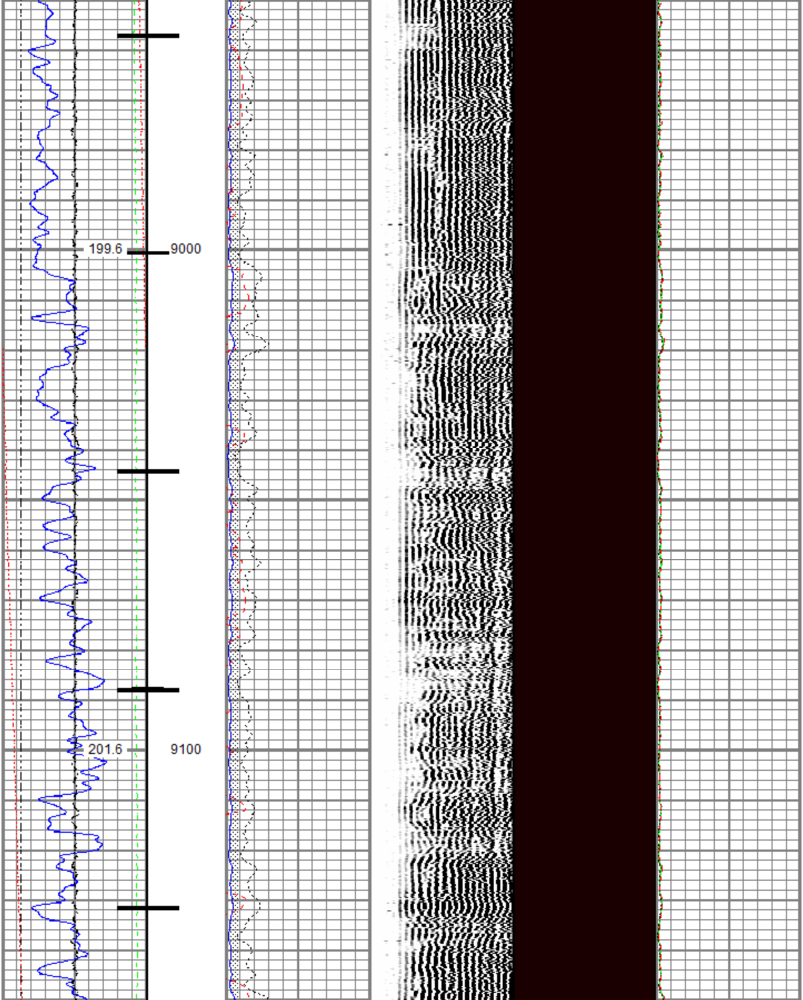


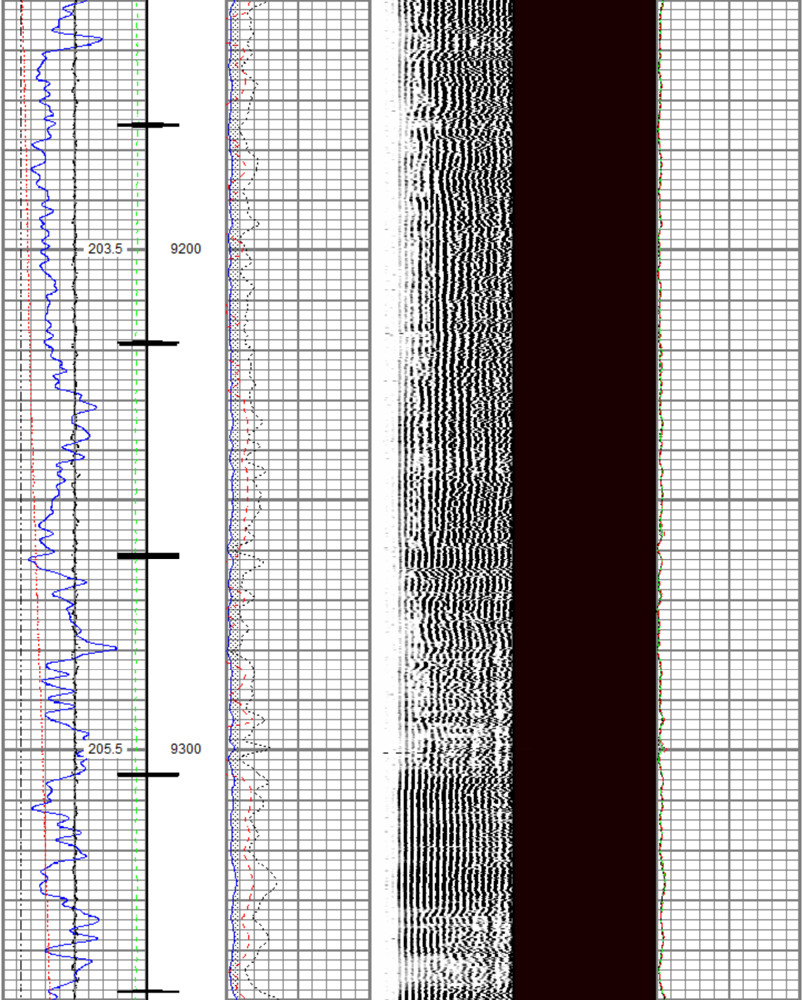


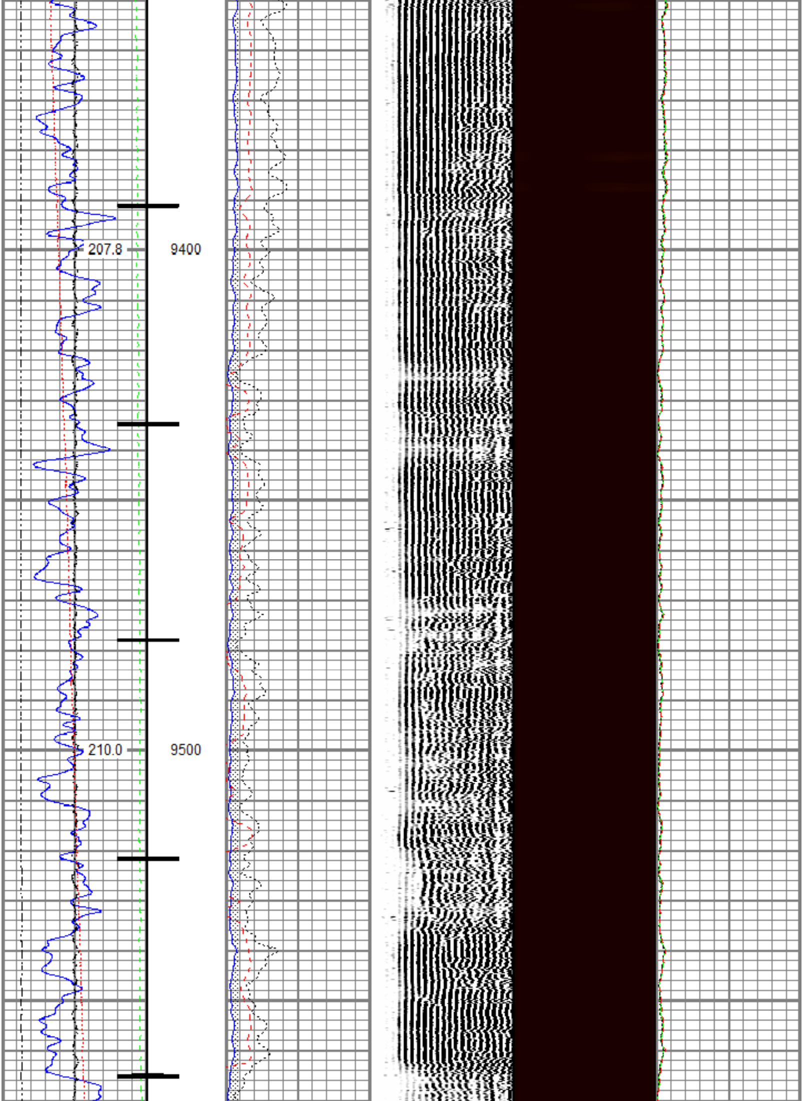


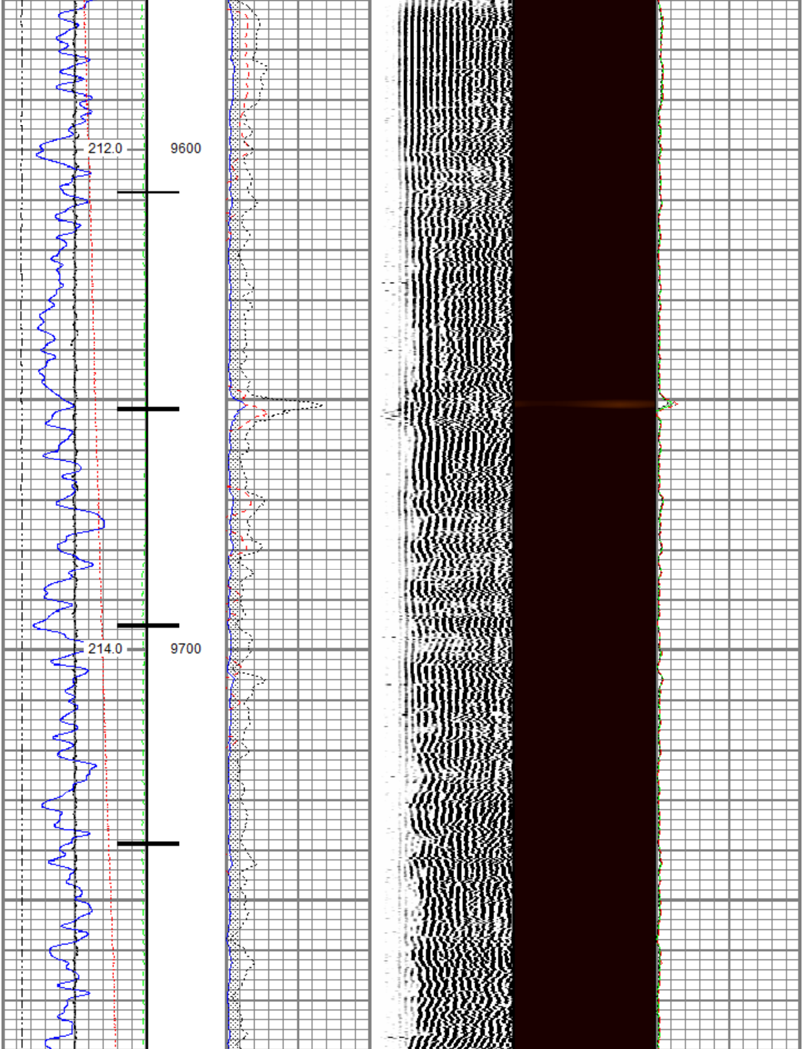


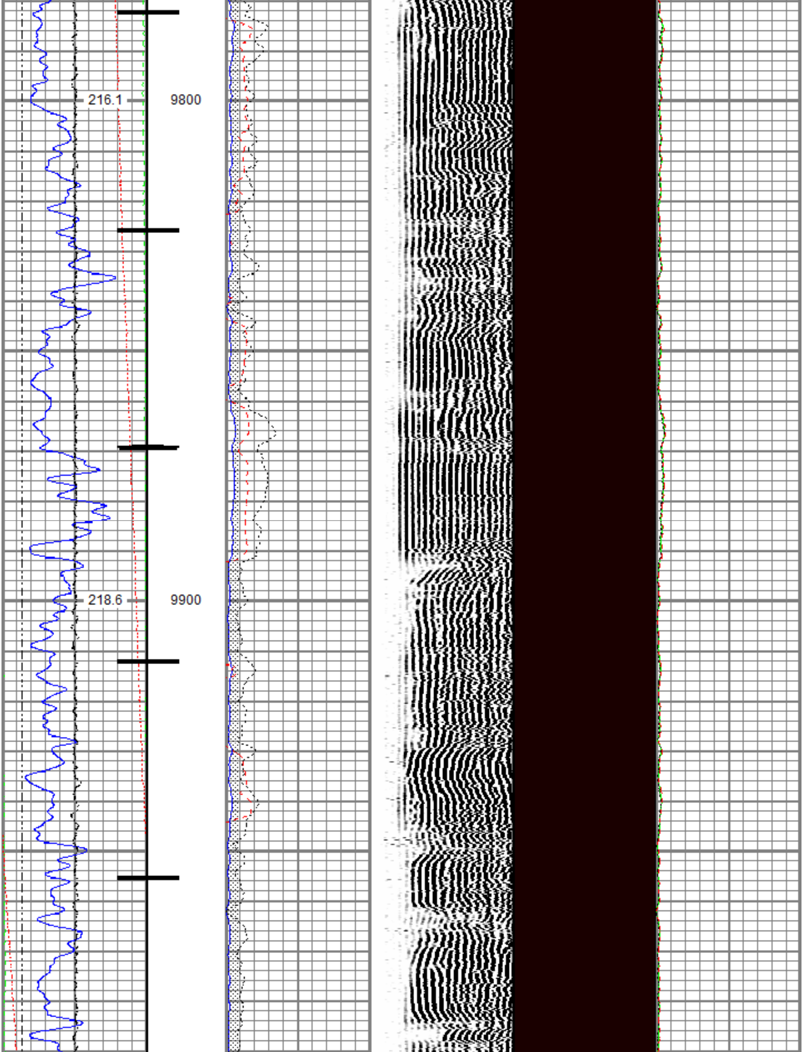


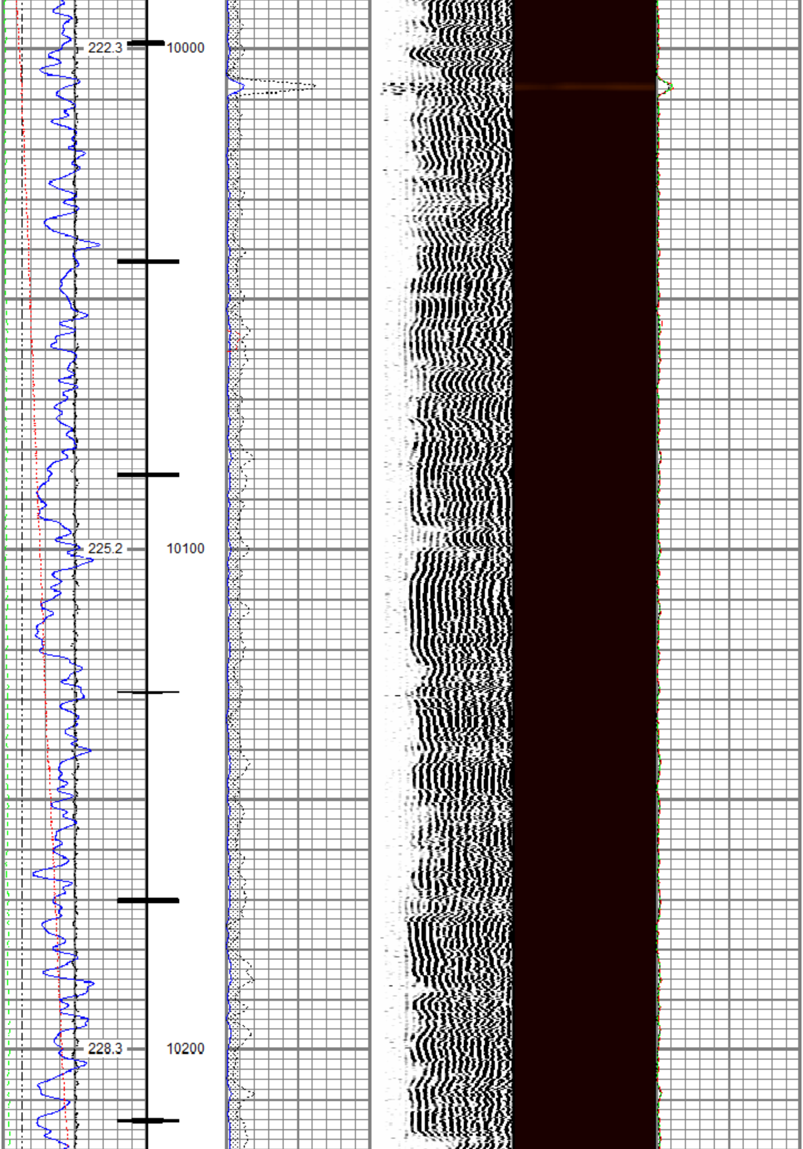


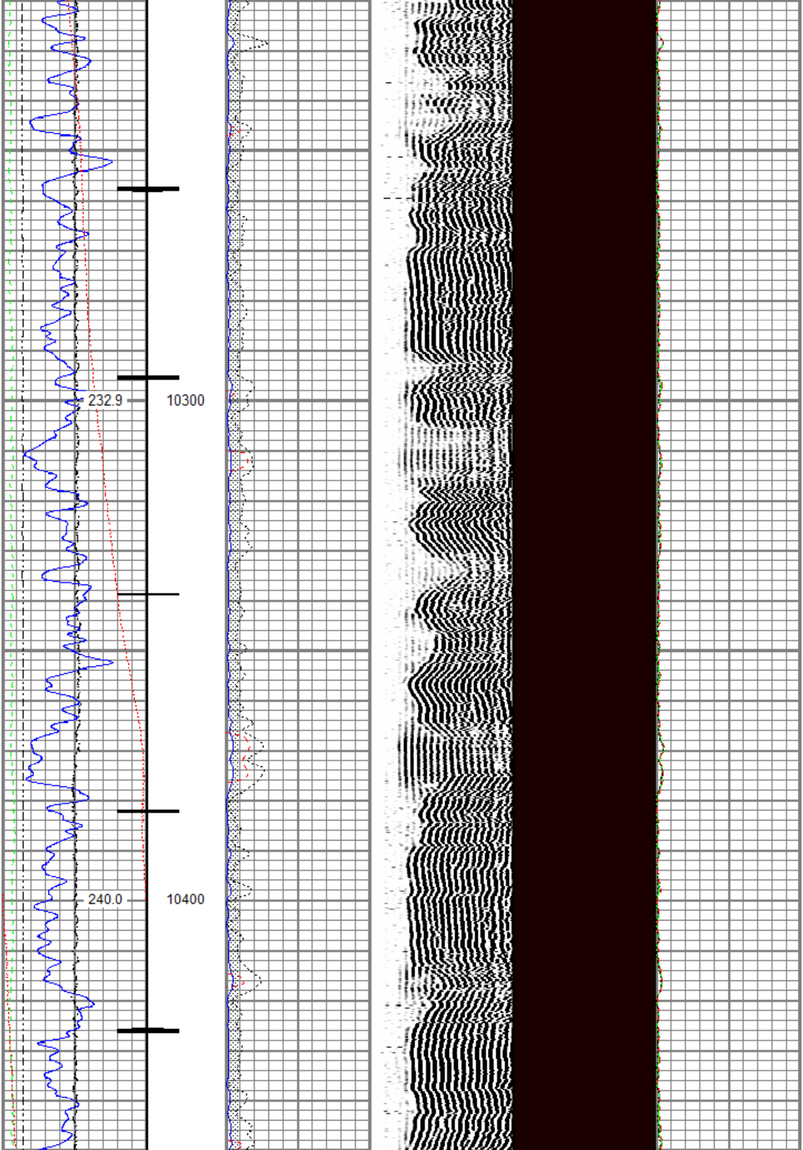


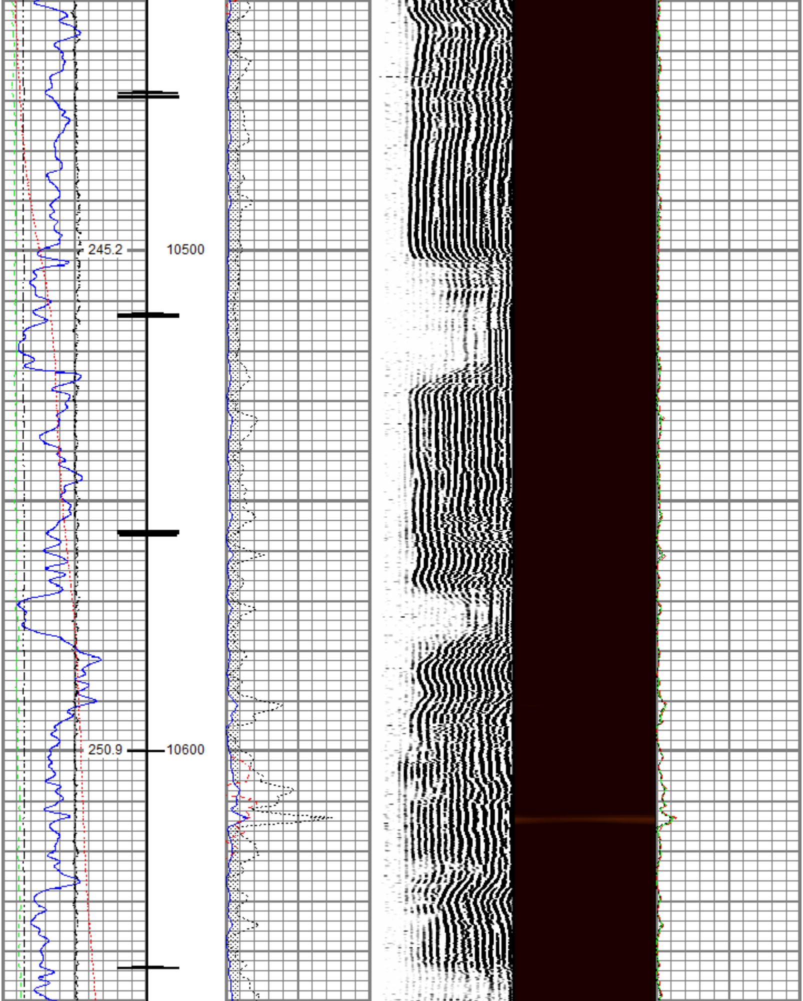


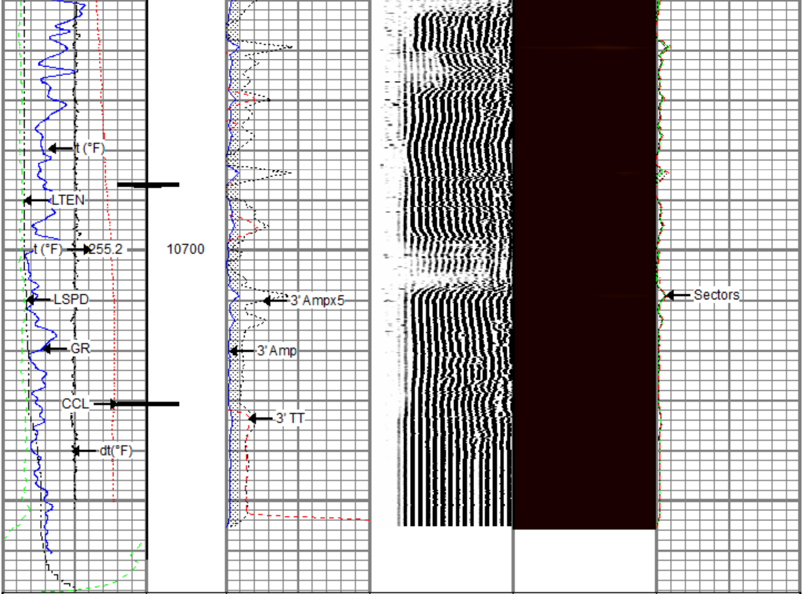












Gamma Ray 0 (GAPI) 200		3' Amplitude 0 (mV) 100	5' Variable Density Log 200 (usec) 1200	Sector Map	Average Amplitude 0 150
Line Speed -150 (ft/min) 150		3' Amplitude x 5 0 (mV) 20			Mimimum Amplitude 0 150
Line Tension 0 (lb) 2000		3' Travel Time 300 (usec) 200			Maximum Amplitude 0 150
Differential Temperature -2 (degF) 2					
Temperature 0 (degF) 20					
Casing Collar Locator					

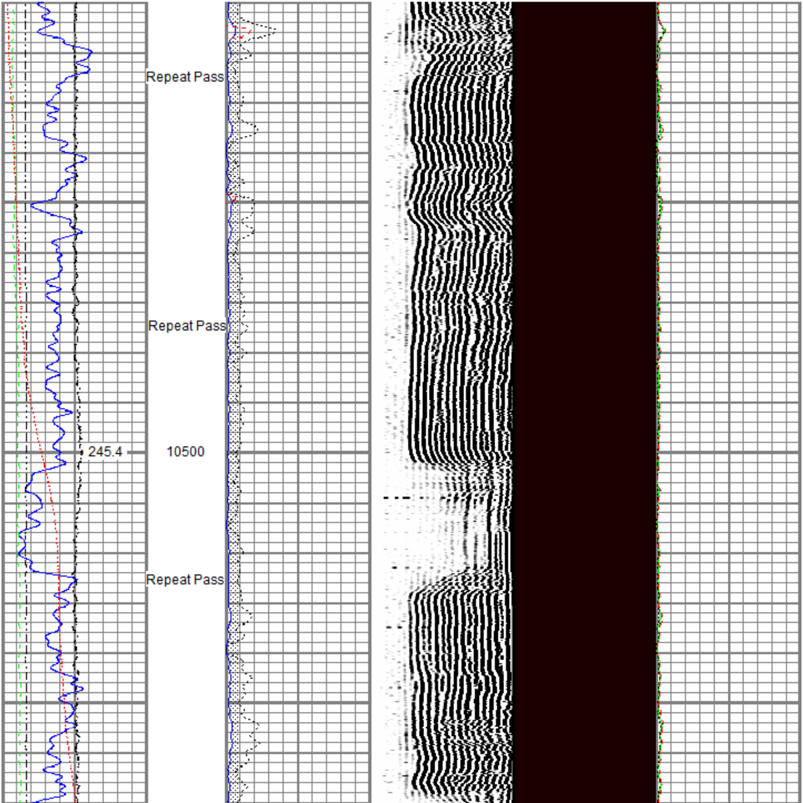
RELIANCE
OILFIELD SERVICES

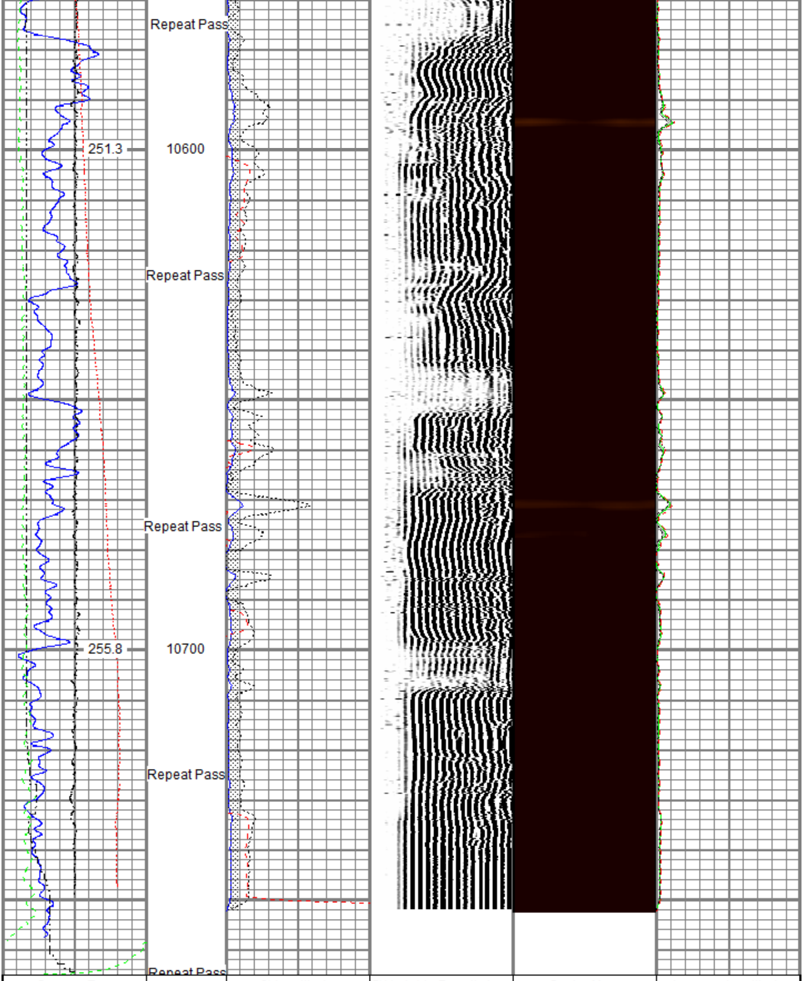
Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep\federal ru 512-17\tep_federal ru 512-17_rbl_04-11-18.db
Dataset Pathname	repeat.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Fri Apr 13 15:36:02 2018
Charted by	Depth in Feet scaled 1:240

Gamma Ray 0 (GAPI) 200		3' Amplitude 0 (mV) 100	5' Variable Density Log 200 (usec) 1200	Sector Map	Average Amplitude 0 150
Line Speed -150 (ft/min) 150		3' Amplitude x 5 0 (mV) 20			Mimimum Amplitude 0 150
Line Tension 0 (lb) 2000		3' Travel Time 300 (usec) 200			Maximum Amplitude 0 150
Differential Temperature -2 (degF) 2					
Temperature 0 (degF) 20					





Gamma Ray
0 (GAPI) 200

Line Speed
-150 (ft/min) 150

Line Tension
0 (lb) 2000

Differential Temperature
-2 (degF) 2

Temperature

3' Amplitude
0 (mV) 100

3' Amplitude x 5
0 (mV) 20

3' Travel Time
300 (usec) 200

5' Variable Density Log
200 (usec) 1200

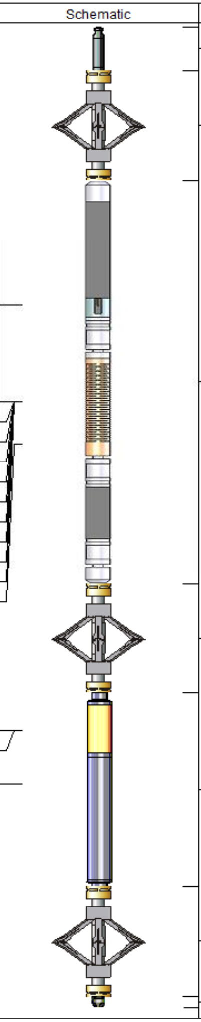
Sector Map

Average Amplitude
0 150

Mimimum Amplitude
0 150

Maximum Amplitude
0 150

0 (degF) 20

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.44	3.60
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
TEMP	16.33					
			Probe Radii-2750 RBT (27125) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS8	14.10					
WVFS7	14.10					
WVFS6	14.10					
WVFS5	14.10					
WVFS4	14.10					
WVFS3	14.10					
WVFS2	14.10					
WVFS1	14.10					
WVFCAL	14.10					
WVF3FT	14.10					
WVF5FT	13.10					
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
CCL$2	6.42					
CCL$1	6.42					
GR	5.18		Probe GR-CCL-2750 GOB (FW1307-038) Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined	4.51	2.75	55.00
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
			GO BN-14375 GO 1-7/16" Bull Nose with Go Box Top	0.25	1.44	1.00

Dataset:	tep_federal ru 512-17_rbl_04-11-18.db: field/well/run1/main.1
Total length:	22.82 ft
Total weight:	260.60 lb
O.D.:	2.75 in

Calibration Report

Database File	c:\programdata\warrior\data\tep\federal ru 512-17\tep_federal ru 512-17_rbl_04-11-18.db
Dataset Pathname	main.1
Dataset Creation	Fri Apr 13 15:18:55 2018

Gamma Ray Calibration Report

Serial Number:	FW1307-038	
Tool Model:	2750 GOB	
Performed:	Sun Nov 12 12:44:12 2017	
Calibrator Value:	637.0	GAPI
Background Reading:	113.2	cps
Calibrator Reading:	1022.4	cps
Sensitivity:	0.7007	GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number:	27125	
Tool Model:	2750 RBT	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	32.948	ft

Master Calibration, performed Wed Apr 11 17:08:33 2018:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.005	0.748	0.000	81.196	107.866	0.532
CAL	-0.006	0.743				
5'	-0.003	0.686	0.000	81.196	117.694	0.411
SUM						
S1	-0.005	0.687	0.000	100.000	144.594	0.724
S2	-0.005	0.693	0.000	100.000	143.435	0.657
S3	-0.005	0.691	0.000	100.000	143.608	0.784
S4	-0.005	0.715	0.000	100.000	139.050	0.637
S5	-0.004	0.708	0.000	100.000	140.433	0.578
S6	-0.005	0.696	0.000	100.000	142.643	0.721
S7	-0.005	0.663	0.000	100.000	149.642	0.776
S8	-0.004	0.736	0.000	100.000	135.001	0.595

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.006	0.743	1.000	0.000

Air Zero Calibration, performed Wed Apr 11 17:09:09 2018:

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	-0.005	0.000	0.000
5'	-0.004	0.000	0.000
SUM			
S1	-0.005	0.000	-0.000
S2	-0.004	0.000	-0.000
S3	-0.005	0.000	-0.000
S4	-0.005	0.000	-0.000
S5	-0.004	0.000	-0.000
S6	-0.005	0.000	-0.001
S7	-0.005	0.000	0.000
S8	-0.005	0.000	0.000

Temperature Calibration Report

Serial Number: 27125
Tool Model: 2750 RBT
Performed: (Not Performed)

	Reference	Reading
Low Reference:	100.00 degF	112.30 degF
High Reference:	350.00 degF	394.75 degF

Gain: 0.89
Offset: 0.60
Delta Spacing 1

RELIANCE
OILFIELD SERVICES

Company	TEP Rocky Mountain LLC
Well	Federal RU 512-17
Field	Rulison
County	Garfield
State	Colorado